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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/047,552	01/14/2002	Daniel Charles Coy	N0030.44	4972

26689 7590 04/01/2003

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EXAMINER

MILLER, JONATHAN R

ART UNIT	PAPER NUMBER
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3653

DATE MAILED: 04/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/047,552

Applicant(s)

COY ET AL.

Examiner

Jonathan R. Miller

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address.

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 January 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Specification

1. This application does not contain an abstract of the disclosure as required by 37 CFR 1.72(b). An abstract on a separate sheet is required.

Drawings

2. Figures 1 and 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1 – 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. Claims 1 and 10 have some language that renders the claims indefinite. First, these claims state that nanoparticles are separated from microparticles. The specification, however, states that the apparatus can separate particles at about 10 microns. What is meant by the terms microparticles and nanoparticles? Is a nanoparticle also a microparticle? The Examiner believes that the language set forth in the title of the application is more specific – sub and supra micron ranges. Is it the applicant's contention that any apparatus that separates at about the 10 micron

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range inherently separates nanoparticles? Furthermore, what is meant by the phrase “of sufficient value”? This renders the claim indefinite.

6. Claim 21 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. What is meant by the phrase “circulating the gas-fluidized fine particle stream inside the classifier vessel **in such a manner** as to define flow patterns within the vessel which **provide for physico-chemical conditions . . .**”? What are the physico-chemical conditions? What does physico-chemical mean?

7. The Examiner regards these rejections as significant. Any claims without art rejections should not be construed as allowable.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1-4 and 6-9 rejected under 35 U.S.C. 102(b) as being anticipated by Chase. The reference discloses the settling chamber having an aspect ratio of the height of the settling chamber to a width of the settling chamber, of sufficient value to allow the formation of two circulation zones of particles (this occurs inherently based upon the shape of the vessel), one above the other, the settling chamber comprising a top section (16) and a bottom section (11) (inherently the vessel can be inverted so the top in the figure could be designated as the bottom);

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an outlet port (19) located in the top section; and an inlet port (14) located in a side of the bottom section.

10. In regards to claim 2, the reference further discloses the bottom section has a first diameter; the inlet port has a second diameter; and the ratio of the first diameter to the second diameter is approximately 4 to 1 (Fig. 1).

11. In regards to claim 3, the reference further discloses the top section has a frustoconical shape with a cone angle of approximately 90° (col. 5, lines 11+; the reference states that there is a wide range of feasible cone angles); and the outlet port is at the top of the frustoconical shape (Fig. 1).

12. In regards to claim 4, the reference further discloses the bottom section of the vessel includes a floor; and the inlet port is located approximately 6 inches above the floor (Fig. 1).

13. In regards to claim 6, the reference further discloses: the outlet port has a third diameter; and the ratio of the third diameter to the second diameter is approximately 1 to 3 (col. 5, lines 2+; the reference clearly states that the diameter of the outlet is variable based on desired flow rates and this disclosure inherently discloses the claimed range).

14. In regards to claim 7, the reference further discloses the bottom and top sections are constructed about a substantially vertical axis; the inlet port is constructed about a substantially horizontal axis; and the axis of the inlet port is substantially perpendicular to the axis of the bottom and top sections (Fig. 1).

15. In regards to claim 8, the reference further inherently discloses the chamber is constructed of stainless steel material.

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16. In regards to claim 9, the reference further inherently discloses the inlet port is welded to the bottom section.

17. Claims 1 – 5 and 7-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Zelazny et al. The reference inherently discloses the settling chamber having an aspect ratio of the height of the settling chamber to a width of the settling chamber, of sufficient value to allow the formation of two circulation zones of particles, one above the other, the settling chamber comprising a top section and a bottom section; an outlet port located in the top section; and an inlet port located in a side of the bottom section (Fig. 2).

18. In regards to claim 2, the reference further discloses the bottom section has a first diameter; the inlet port has a second diameter; and the ratio of the first diameter to the second diameter is approximately 4 to 1 (Fig. 2).

19. In regards to claim 3, the reference further discloses the top section has a frustoconical shape with a cone angle of approximately 90°; and the outlet port is at the top of the frustoconical shape (Fig. 2).

20. In regards to claim 4, the reference further discloses the bottom section of the vessel includes a floor; and the inlet port is located approximately 6 inches above the floor (col. 3, lines 63+).

21. In regards to claim 5, the reference further discloses the chamber has a particular height; and the ratio of the second diameter to the height of the chamber is approximately 1 to 3.5 (fig. 2).

22. In regards to claim 7, the reference further discloses the bottom and top sections are constructed about a substantially vertical axis; the inlet port is constructed about a substantially

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horizontal axis; and the axis of the inlet port is substantially perpendicular to the axis of the bottom and top sections (Fig. 2).

23. In regards to claim 8, the reference further discloses the chamber is constructed of stainless steel material (col. 3, lines 1+).

24. In regards to claim 9, the reference further inherently discloses the inlet port is welded to the bottom section.

25. In regards to claim 10, the reference further discloses providing a settling chamber including a bottom section having a first diameter, a top section with an outlet port located therein, and an inlet port having a second diameter located in a side of the bottom section; introducing a gas fluidized particle stream through the inlet port into the settling chamber at a given velocity; establishing a gas stream flow pattern within the settling chamber that retards transportation of microparticles to the outlet port while facilitating transportation of nanoparticles to the outlet port; and collecting the nanoparticles from the outlet port (Fig. 2; col. 3, lines 14+). The reference discloses a separation on the order of 10 – 500 microns. Inherently, all particles below this cut-off size are passed on, which includes nanoparticles.

26. In regards to claim 11, the reference further inherently discloses the gas stream flow pattern is introduced into the settling chamber at a velocity of 10-1000 scfm (col. 2, lines 32+). The flow rates are variable and dependent upon the overall size of the apparatus and the inlets and outlets.

27. In regards to claim 12, the reference further inherently discloses the gas stream flow pattern is introduced into the settling chamber at a velocity of 100-200 scfm (col. 2, lines 32+).

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The flow rates are variable and dependent upon the overall size of the apparatus and the inlets and outlets.

28. In regards to claim 13, the reference further inherently discloses the step of creating an interface between the main recirculating flow pattern and the secondary recirculating flow pattern. This occurs inherently based upon the shape of the vessel

29. In regards to claim 14, the reference further inherently discloses establishing a main recirculating flow pattern in the bottom section of the chamber; and establishing a secondary recirculating flow pattern sympathetic to the main flow pattern in the top section of the chamber. This occurs inherently based upon the shape of the vessel

30. In regards to claim 15, the reference further discloses the nanoparticles are comprised of one of the following: metal oxide nanoparticles, metal nanopowders, metal nitride, mixed metal oxides or metal sulfide nanoparticles (col. 1, lines 1+).

Conclusion

31. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Further prior art is listed in the enclosed Form 892. Any amendments should also be reconciled with these references.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan R. Miller whose telephone number is (703) 305-5778. The examiner can normally be reached on M-F: 8:30AM-5:00PM.

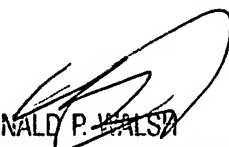
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Donald P. Walsh can be reached on (703) 306-4173. The fax phone numbers for the

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organization where this application or proceeding is assigned are (703) 305-7687 for regular communications and (703) 305-7687 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1113.

jrm
March 24, 2003



DONALD P. WALSBY
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3600